

**What is claimed is:**

1. A method of endoluminally delivering a valvular prosthesis within an anatomic passageway to replace an anatomic valve using a catheter comprised of at least two sections near the distal end of the catheter, a first section consisting of the valvular prosthesis covered by a sheath, and a second section consisting of an inflatable balloon, comprising the steps of:

passing the at least two sections of the catheter through an anatomic passageway so that the second section is passed distally through the anatomic valve such that a portion of the inflatable balloon is within the anatomic valve;

contacting the inflatable balloon to a surface of the anatomic valve by inflating the inflatable balloon to dilatate the anatomic valve;

positioning the first section within the anatomic valve for deployment of the valvular prosthesis; and

withdrawing the sheath and the catheter to release the valvular prosthesis from the sheath onto the dilatated anatomic valve to functionally replace the anatomic valve.

2. The method of endoluminally delivering a valvular prosthesis according to claim 1, wherein the first section resides near the distal end of the catheter and distal to the second section along the length of the catheter, and the passing step further comprises passing the catheter along the anatomic passageway until the first section passes distally through the anatomic valve.

3. The method of endoluminally delivering a valvular prosthesis according to claim 2, wherein the positioning step comprises withdrawing the catheter to remove the second section away from the anatomic valve and allow the first section to reside within the anatomic valve.

4. The method of endoluminally delivering a valvular prosthesis according to claim 2, wherein the valvular prosthesis is self-expanding and has anchoring flanges projecting substantially radially outwardly from the valvular prosthesis and positioned at a distal end of the valvular prosthesis, and wherein the withdrawing step further comprises the steps of:

withdrawing the sheath to deploy the anchoring flanges, and

engaging the anchoring flanges to the distal end of the anatomic valve, thereby

positioning the valvular prosthesis within the anatomic valve.

5. The method of claim 2 wherein the catheter has a delivery profile of 12 French size or smaller.

6. The method of claim 2 wherein the catheter is further comprised of a guidewire shaft positioned co-axially within the central longitudinal lumen and an annular plug member concentrically coupled to the guidewire shaft, and wherein the withdrawing step further includes the step of maintaining the position of the guidewire shaft as the catheter is withdrawn in retrograde fashion so that the annular plug member maintains the position of the valvular prosthesis while deploying the valvular prosthesis within the anatomic valve.

7. The method of endoluminally delivering a valvular prosthesis according to claim 1, wherein the second section resides near the distal end of the catheter and distal to the first section along the length of the catheter, and the passing step further comprises passing the catheter along the anatomic passageway until the second section resides within the anatomic valve.

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8. The method of endoluminally delivering a valvular prosthesis according to claim 7, wherein the positioning step further comprises passing the second section distally through the anatomic valve and positioning the first section within the anatomic valve.

9. The method of endoluminally delivering a valvular prosthesis according to claim 7, wherein the valvular prosthesis is self-expanding and includes anchoring flanges projecting substantially radially outward from the valvular prosthesis at a distal end of the valvular prosthesis, and wherein the withdrawing step further comprises the steps of:

withdrawing the sheath to deploy the anchoring flanges, and

engaging the anchoring flanges to the distal end of the anatomic valve, thereby

15 positioning the valvular prosthesis within the anatomic valve.

10. The method of claim 7 wherein the catheter has a delivery profile of 12 French size or smaller.

11. The method of claim 7 wherein the catheter is further comprised of a guidewire shaft positioned co-axially within the central longitudinal lumen and an annular plug member concentrically coupled to the guidewire shaft, and wherein the withdrawing step further includes the step of maintaining the position of the guidewire shaft as the catheter is withdrawn in retrograde fashion so that the annular plug member maintains the position of the valvular prosthesis while deploying the valvular prosthesis within the anatomic valve.

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